

LOCATE THE HIDDEN TREASURE

Suggested Grade

4

SD Mathematics Strand & Standard (*Primary for Task*)

Algebra

4.A.4.1. Students are able to solve patterns involving pattern identification and completion of patterns

Task Summary

Students will Identify and complete patterns, describing the associated rule.

Time and Context of Task

1 day- following lesson on patterns

Materials Needed

Construction paper, floor grid

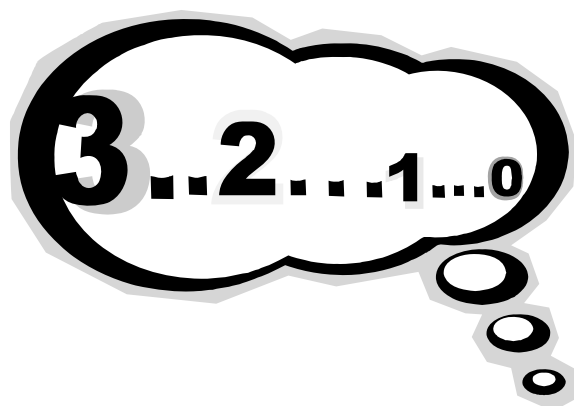
Author and Lead Teacher for the Task

Kelly Hinds

Simmons Elementary, Aberdeen SD

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Working with a partner- each student individually will create a sequence of 4 numbers and a rule for the sequence. Each student will then write treasures, such as, gold, Gameboy, Disney World, etc... on the back of construction paper squares. They will place these on the correct numbers in the sequence they have created (7 numbered treasures in all) on the appropriate numbers on the floor grid with the treasure facing down. On the other numbers will be blank pieces of paper. Partners will exchange sequences and try to solve the sequence in finding the next 3 numbers and therefore uncover all the treasures. Each student will write how they determined the rule and sequence they created and also the rule and the sequence they solved to find the treasures.



CONTENT STANDARDS

Primary Standard

Strand Name: Algebra

SD Goal: Students will use the language of algebra to explore, describe, represent, and analyze number expressions and relations that represent variable quantities.

Indicator: Describe and use the properties and behaviors of relations, functions and inverses.

Standard: 4.A.4.1. Students are able to solve patterns involving pattern identification and completion of patterns.

NCTM Process Standard

Problem Solving

- Communicate their mathematical thinking coherently and clearly to peers, teachers, and others

Problem-Solving Strategies

- Looking for patterns

ASSESSMENT TOOLS

Task Rubric

Standard	Advanced	Proficient	Basic	Below Basic
4.A.4.1. Students are able to solve patterns involving pattern identification and completion of patterns.	<i>A rule is written to describe a pattern and the pattern is displayed correctly. A pattern is solved correctly and the rule is stated correctly.</i>	<i>Identify and complete pattern and describe the associated rule.</i>	<i>Pattern is displayed but the rule given is incorrect. The rule given does not match the pattern. Pattern is solved, no rule is given.</i>	<i>No pattern is displayed. No rule is given for pattern. No pattern is solved.</i>
Communicate their mathematical thinking coherently and clearly to peers, teachers, and others	<i>An in-depth explanation is given for solving the pattern.</i>	<i>Mathematical representations helped clarify solution.</i>	<i>Mathematical representations somewhat helpful in clarifying solution.</i>	<i>Mathematical representations did not clarify thinking.</i>

**Fourth Grade Algebra
Performance Descriptors**

Advanced	Fourth grade students performing at the advanced level: <ul style="list-style-type: none"> • solve algebraic equations using inverse operations and order of operations with addition and subtraction using whole numbers; • solve word problems by converting them to algebraic statements; • create patterns to solve problems and justify their solution.
Proficient	Fourth grade students performing at the proficient level: <ul style="list-style-type: none"> • use the commutative property of addition and multiplication; • identify and complete patterns and describe the associated rule; • write and solve number sentences using whole numbers; • simplify a two-step equation using whole numbers; • show relationships between all operations; • simplify whole number expressions in all operations; • select appropriate relational symbols to make number sentences true.
Basic	Fourth grade student performing at the basic level: <ul style="list-style-type: none"> • show relationship between addition and subtraction; • simplify whole number expressions in addition and subtraction; • using whole numbers, solve number sentences.

**Fourth Grade Algebra
ELL Performance Descriptors**

Proficient	Fourth grade ELL students performing at the proficient level: <ul style="list-style-type: none"> • write and solve number sentences that represent word problems; • use variables as place holders in number sentences; • recognize simple patterns; • identify and complete patterns and describe the associated rule; • read, write, and speak the language of mathematics.
Intermediate	Fourth grade ELL students performing at the intermediate level: <ul style="list-style-type: none"> • solve simple number sentences using the four basic operations and a model; • create numerical expressions from oral or written contexts; • explain in mathematical terms the sequence of steps in solving two-step problems; • give simple oral or written responses to directed questions on topics presented in class.
Basic	Fourth grade ELL students performing at the basic level: <ul style="list-style-type: none"> • write numerals and mathematics symbols; • solve problems using addition, subtraction, and multiplication; • recognize and use basic algebraic terms; • respond to yes or no questions and to problems presented pictorially or numerically in class.
Emergent	Fourth grade ELL students performing at the emergent level: <ul style="list-style-type: none"> • begin to use number sentences using symbolic representations; • give simple oral responses to directed questions on topics presented in class; • copy and write numerals and mathematics symbols; • imitate pronunciation of numbers and mathematical terms; • use non-verbal communication to express mathematical ideas.
Pre-emergent	Fourth grade ELL students performing at the pre-emergent level: <ul style="list-style-type: none"> • observe and model appropriate cultural and learning behaviors from peers and adults; • listen to and observe comprehensible instruction and communicate understanding non-verbally.

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Student Work Samples



As you examine the samples, consider the following questions:

- In light of the standard/s addressed and the assessment tools provided, what evidence does the work provide that students are achieving proficiency in the knowledge and skills addressed by the standard/s for the task?
- Is the task/activity well designed to help students acquire knowledge and demonstrate proficiency? Is the task/activity clearly aligned with the standards? In what ways would you adapt the task/activity to better meet the needs of your students?

Student Work Sample #1

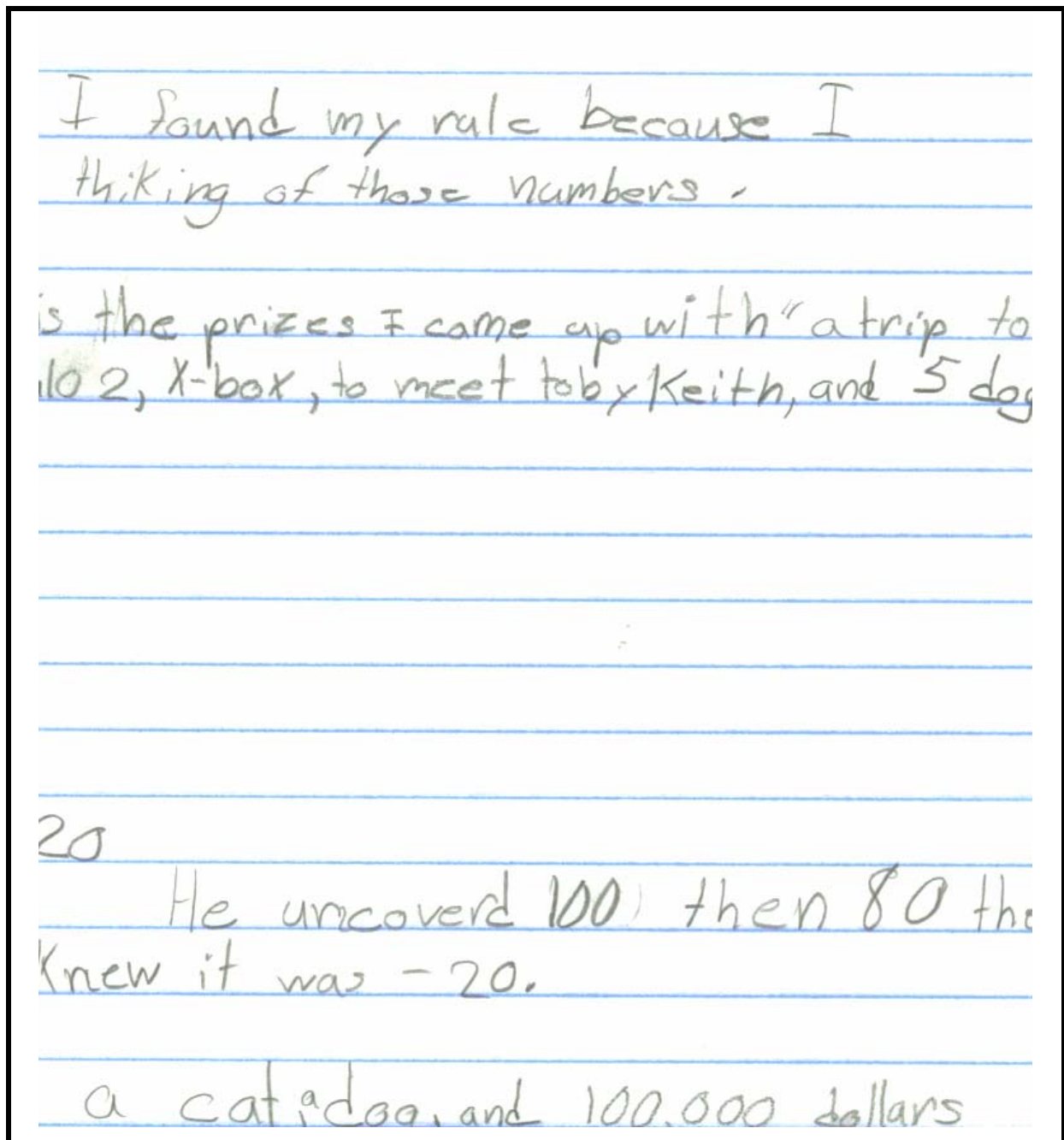
The way I found my friends pattern. Here are the first three numbers 10, 46, 27 and the rule was add 36 minus 19 so I did the math I took $27 + 36 = 50$ so first I took $20 + 30 = 50$ then I added 6 on to 50 which made 56 and then I added 7 on to 56 and thought $56 + 4 = 60$ and $4 + 3 = 7$ so I found out that I added 3 on to 60 which made 63.

Looking at Student Work – Instructor notes and rating for work sample #1:

Based on the task rubric and the Content Standard Performance Descriptors, the lead teacher rated this student's work ADVANCED.

What evidence do you see in the student work that demonstrates that this student has an ADVANCED skill level?

Student Work Sample #2

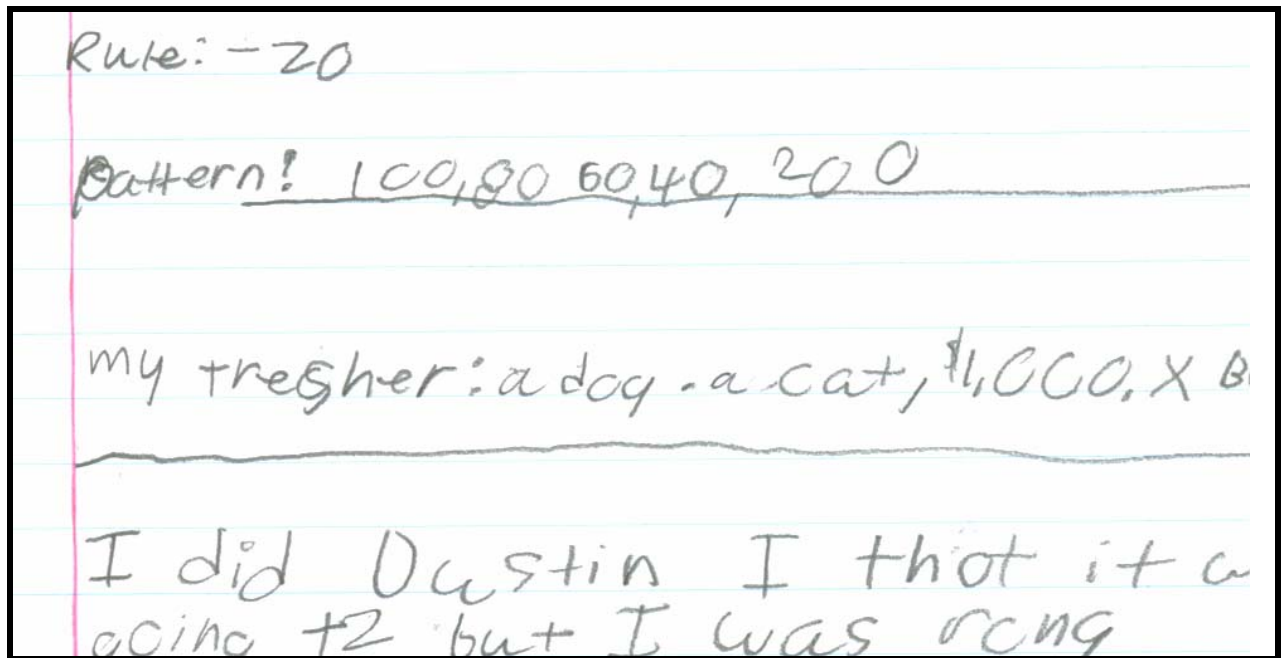


Looking at Student Work – Instructor notes and rating for work sample #2:

Based on the task rubric and the Content Standard Performance Descriptors, the lead teacher rated this student's work PROFICIENT.

What evidence do you see in the student work that demonstrates that this student has a PROFICIENT skill level?

Student Work Sample #3



Looking at Student Work – Instructor notes and rating for work sample #3:

Based on the task rubric and the Content Standard Performance Descriptors, the lead teacher rated this student's work BASIC.

What evidence do you see in the student work that demonstrates that this student has a BASIC skill level?

INSTRUCTIONAL NOTES

Author Comments

Using a white shower curtain create a number grid using permanent marker for your floor grid. (Numbers 1-50)

Web Resources for Finding Patterns

Interactive Student Activities

- http://pbskids.org/cyberchase/webisode_1/web_1game.html
- <http://pbskids.org/cyberchase/games/patterns/patterns.html>
- <http://pbskids.org/cyberchase/games/functions/functions.html>
- http://www.pbs.org/teachersource/mathline/lessonplans/atmp/bead/bead_procedure.shtm
- <http://pbskids.org/zoom/activities/sci/guessmyrule.html>
- <http://pbskids.org/zoom/activities/sci/squarewalk.html>

Teacher Lesson Plan Resources

- <http://pbskids.org/cyberchase/parentsteachers/lessonplans/lesson12.html>
- <http://pbskids.org/cyberchase/parentsteachers/lessonplans/lesson4.html>
- http://www.pbs.org/teachersource/mathline/lessonplans/esmp/herethere/herethere_procedure.shtm
- http://www.pbs.org/teachersource/mathline/lessonplans/esmp/magicbox/magicbox_procedure.shtm
- http://www.pbs.org/teachersource/mathline/lessonplans/atmp/snake/snake_procedure.shtm
- <http://www.pbs.org/saf/1207/teaching/teaching2.htm>

Interdisciplinary Connections

Science-Exploring the ocean bottom

Literature Connections

Brown Bear, Brown Bear What do You See? by Bill Martin Jr., Eric Carle (Illustrator)

Resources

SD Mathematics Content Standards

<http://www.doe.sd.gov/contentstandards/math/index.asp>

SD Assessment and Testing

<http://www.doe.sd.gov/octa/assessment/index.asp>

The National Assessment of Educational Progress (NAEP)

<http://www.doe.sd.gov/octa/assessment/naep/index.asp>

National Council of Teachers of Mathematics

<http://nctm.org/>

Looking at Student Work

<http://www.lasw.org/index.html>